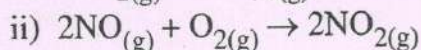
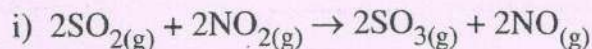


CHEMISTRY

51. A certain reaction occurs in two steps as



In the reaction,

A) $\text{NO}_{2(g)}$ is intermediate

B) $\text{NO}_{(g)}$ is intermediate

C) $\text{NO}_{(g)}$ is catalyst

D) $\text{O}_{2(g)}$ is intermediate

52. Which among the following equations represents the first law of thermodynamics under isobaric conditions ?

A) $\Delta U = q_p - P_{\text{ex}} \cdot \Delta V$

B) $q_v = \Delta U$

C) $\Delta U = W$

D) $W = -q$

53. During galvanization of iron, which metal is used for coating iron surface ?

A) Copper

B) Zinc

C) Nickel

D) Tin

54. Formation of PCl_3 is explained on the basis of what hybridisation of phosphorus atom ?

A) SP^2

B) SP^3

C) SP^3d

D) SP^3d^2

55. Identify the element that forms amphoteric oxide.

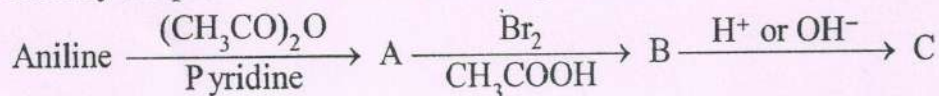
A) Carbon

B) Zinc

C) Calcium

D) Sulphur

56. Identify the product 'C' in the following reaction.



A) Acetanilide

B) p - Bromoacetanilide

C) p - Bromoaniline

D) o - Bromoaniline

57. Identify the functional group that has electron donating inductive effect.

A) $-\text{COOH}$

B) $-\text{CN}$

C) $-\text{CH}_3$

D) $-\text{NO}_2$

58. Which among the following metals crystallise as a simple cube ?

A) Polonium

B) Iron

C) Copper

D) Gold

59. Which among the following oxoacids of phosphorus shows a tendency of disproportionation ?

A) Phosphinic acid (H_3PO_2)

B) Orthophosphoric acid (H_3PO_4)

C) Phosphonic acid (H_3PO_3)

D) Pyrophosphoric acid ($\text{H}_4\text{P}_2\text{O}_7$)

60. What is the oxidation number of gold in the complex $[\text{AuCl}_4]^{1-}$?

A) +4

B) +3

C) +2

D) +1

61. Which symbol replaces the unit of atomic mass, amu ?

A) u

B) A

C) M

D) n

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62. Which of the following compounds reacts immediately with Lucas reagent ?
 A) $\text{CH}_3\text{CH}_2\text{OH}$ B) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
 C) $\text{CH}_3 - \underset{\text{OH}}{\text{CH}} - \text{CH}_3$ D) $\text{CH}_3 - \overset{\text{CH}_3}{\underset{\text{OH}}{\text{C}}} - \text{CH}_3$
63. What is the catalyst used for oxidation of SO_2 to SO_3 in lead chamber process for manufacture of sulphuric acid ?
 A) Nitric oxide B) Nitrous oxide C) Potassium iodide D) Dilute HCl
64. The number of moles of electrons passed when current of 2 A is passed through an solution of electrolyte for 20 minutes is
 A) $4.1 \times 10^{-4} \text{ mol e}^-$ B) $1.24 \times 10^{-2} \text{ mol e}^-$
 C) $2.487 \times 10^{-2} \text{ mol e}^-$ D) $2.487 \times 10^{-1} \text{ mol e}^-$
65. The molarity of urea (molar mass 60 g mol^{-1}) solution by dissolving 15 g of urea in 500 cm^3 of water is
 A) 2 mol dm^{-3} B) 0.5 mol dm^{-3} C) $0.125 \text{ mol dm}^{-3}$ D) $0.0005 \text{ mol dm}^{-3}$
66. Which carbon atom of deoxy Ribose sugar in DNA does NOT contain $\begin{array}{c} | \\ -\text{C}-\text{OH} \\ | \end{array}$ bond ?
 A) C_5 B) C_3 C) C_2 D) C_1
67. Which of the following carboxylic acids is most reactive towards esterification ?
 A) $(\text{CH}_3)_3\text{CCOOH}$ B) $(\text{CH}_3)_2\text{CHCOOH}$
 C) $\text{CH}_3\text{CH}_2\text{COOH}$ D) $(\text{C}_2\text{H}_5)_2\text{CHCOOH}$
68. Molarity is
 A) The number of moles of solute present in 1 dm^3 volume of solution
 B) The number of moles of solute dissolved in 1 kg of solvent
 C) The number of moles of solute dissolved in 1 kg of solution
 D) The number of moles of solute dissolved in 100 dm^3 volume of solution
69. Which of the followings is a tricarboxylic acid ?
 A) Citric acid B) Malonic acid C) Succinic acid D) Malic acid
70. What is the number of donar atoms in dimethylglyoximato ligand ?
 A) 1 B) 2 C) 3 D) 4
71. In which substance does nitrogen exhibit the lowest oxidation state ?
 A) nitrogen gas B) ammonia C) nitrous oxide D) nitric oxide
72. Which of the followings is most reactive towards addition reaction of hydrogen cyanide to form corresponding cyanohydrin ?
 A) Acetone B) Formaldehyde C) Acetaldehyde D) Diethylketone
73. The most basic hydroxide from following is
 A) $\text{Pr}(\text{OH})_3$ ($Z = 59$) B) $\text{Sm}(\text{OH})_3$ ($Z = 62$)
 C) $\text{Ho}(\text{OH})_3$ ($Z = 67$) D) $\text{La}(\text{OH})_3$ ($Z = 57$)

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74. What is the SI unit of density ?
 A) g cm^{-3} B) g m^{-3} C) kg m^{-3} D) kg cm^{-3}
75. Which of the following compounds does **NOT** undergo haloform reaction ?
 A) $\text{CH}_3 - \underset{\text{OH}}{\text{CH}} - \text{CH}_3$ B) $\text{CH}_3 - \underset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{CH}_3$
 C) $\text{C}_2\text{H}_5 - \underset{\text{OH}}{\text{CH}} - \text{C}_2\text{H}_5$ D) $\text{CH}_3 - \underset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{C}_2\text{H}_5$
76. Two moles of an ideal gas are allowed to expand from a volume of 10 dm^3 to 2 m^3 at 300 K against a pressure of 101.325 KPa . Calculate the work done.
 A) -201.6 kJ B) 13.22 kJ C) -810.6 J D) -18.96 kJ
77. In which among the following solids, Schottky defect is **NOT** observed ?
 A) ZnS B) NaCl C) KCl D) CsCl
78. What are the products of auto-photolysis of water ?
 A) H_2 and O_2 B) Steam C) H_3O^+ and OH^- D) Hydrogen peroxide
79. Bauxite, the ore of aluminium, is purified by which process ?
 A) Hoope's process B) Hall's process C) Mond's process D) Liquation process
80. Phenol in presence of sodium hydroxide reacts with chloroform to form salicylaldehyde. The reaction is known as
 A) Kolbe's reaction B) Reimer-Tiemann reaction
 C) Stephen reaction D) Etard reaction
81. Which among the following elements of group-2 exhibits anomalous properties ?
 A) Be B) Mg C) Ca D) Ba
82. Excess of ammonia with sodium hypochloride solution in the presence of glue or gelatine gives
 A) NaNH_2 B) NH_2NH_2 C) N_2 D) NH_4Cl
83. What is the density of solution of sulphuric acid used as an electrolyte in lead accumulator ?
 A) 1.5 g mL^{-1} B) 1.2 g mL^{-1} C) 1.8 g mL^{-1} D) 2.0 g mL^{-1}
84. Which of the following polymers is used to manufacture clothes for firefighters ?
 A) Thiokol B) Kevlar C) Nomex D) Dynel
85. Which element is obtained in the pure form by van Arkel method ?
 A) Aluminium B) Titanium C) Silicon D) Nickel
86. Which of the followings is **NOT** a tranquilizer ?
 A) Meprobamate B) Equanil
 C) Chlordiazepoxide D) Bromopheniramine
87. Conversion of hexane into benzene involves the reaction of
 A) hydration B) hydrolysis C) hydrogenation D) dehydrogenation
88. The element that does **NOT** exhibit allotropy is
 A) phosphorus B) arsenic C) antimony D) bismuth

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89. Which of the following reactions is used to prepare aryl fluorides from diazonium salts and fluoroboric acid ?
 A) Sandmeyer reaction B) Balz-Schiemann reaction
 C) Gattermann reaction D) Swarts reaction
90. The correct relation between elevation of boiling point and molar mass of solute is
 A) $M_2 = \frac{K_b \cdot W_2}{\Delta T_b \cdot W_1}$ B) $M_2 = \frac{K_b \cdot W_1}{\Delta T_b \cdot W_2}$ C) $M_2 = \frac{\Delta T_b \cdot K_b}{W_1 \cdot W_2}$ D) $M_2 = \frac{\Delta T_b \cdot W_1}{K_b \cdot W_2}$
91. Which among the group - 15 elements does **NOT** exist as tetra atomic molecule ?
 A) Nitrogen B) Phosphorus C) Arsenic D) Antimony
92. Identify the monosaccharide containing only one asymmetric carbon atom in its molecule.
 A) Ribulose B) Ribose C) Erythrose D) Glyceraldehyde
93. Identify the oxidation states of titanium ($Z = 22$) and copper ($Z = 29$) in their colourless compounds.
 A) Ti^{3+} , Cu^{2+} B) Ti^{2+} , Cu^{2+} C) Ti^{4+} , Cu^{1+} D) Ti^{4+} , Cu^{2+}
94. Arenes on treatment with chlorine in presence of ferric chloride as a catalyst undergo what type of reaction ?
 A) Electrophilic substitution B) Nucleophilic substitution
 C) Electrophilic addition D) Nucleophilic addition
95. In case of R, S configuration the group having highest priority is
 A) $-NO_2$ B) $-NH_2$ C) $-CN$ D) $-OH$
96. Lactic acid and glycolic acid are the monomers used for preparation of polymer
 A) Nylon-2-nylon-6 B) Dextran
 C) PHBV D) Buna-N
97. What is the geometry of water molecule ?
 A) distorted tetrahedral B) tetrahedral
 C) trigonal planar D) diagonal
98. With which halogen the reactions of alkanes are explosive ?
 A) Fluorine B) Chlorine C) Bromine D) Iodine
99. Calculate the work done during combustion of 0.138 kg of ethanol, $C_2H_5OH_{(l)}$ at 300 K. Given : $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$, molar mass of ethanol = 46 g mol^{-1} .
 A) -7482 J B) 7482 J C) -2494 J D) 2494 J
100. Slope of the straight line obtained by plotting $\log_{10} k$ against $1/T$ represents what term ?
 A) $-E_a$ B) $-2.303 E_a/R$ C) $-E_a/2.303 R$ D) $-E_a/R$

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